SPECIFICATION AMENDMENTS

Please replace the paragraph beginning on page 14, line 7, with the following:

Non-patent document 7: T. A. Birks, D. Mogilevtsev, J. C. Knight, P. St. J. Russell, "~~Dispersion compensation using single-material fibers~~ Endlessly single-mode photonic crystal fiber" Opt. Lett. 22, 1997, pp. 961-963.

Please replace the paragraph beginning on page 14, line 22, with the following:

Non-patent document 12: Gorachand Ghosh, "Sellmeier Coefficients and Chromatic ~~Dispersiond~~ Dispersions for Some Tellurite Glasses", J. Am. Soc., 78(10) 2828-2830, 1995.

Please replace the paragraph [0053] starting at the top of page 26, with the following:

In addition, embedding, in the core region, tellurite glass with a composition providing a refractive index higher than that of the tellurite glass of the cladding sections makes it possible for the light propagating through the core region to undergo total reflection at the interface between the embedded tellurite glass with the higher refractive index and the tellurite glass surrounding it, and to propagate through the core of optical fiber. Thus, the transmission loss of the light can be reduced.

Please replace the paragraph beginning on page 38, line 27, with the following:

2103, 2303, 2403, 2503, 2505, 2603, 2703, 2803, 2903, 3003, ~~3005~~, 3103, 3203, 3303 air holes

Please replace paragraph [0072] starting on page 46, with the following:

However, at the center of the optical fiber 10, the disposition of the air holes 11 lacks periodicity. The region~~, that is the core region,~~ surrounded by the air holes 11 arranged with lacking the periodicity is from 0.1 to five time of $\pi\lambda^2$, where λ is the wavelength of the light, and π is the circular constant. The region becomes the core 12 to which the light is concentrated, and the light does not propagate from that region in the radial direction of the optical fiber 10. In other words, the optical fiber 10 has a photonic bandgap structure having a diffraction grating in which the air holes 11 are disposed periodically arrangement. Thus, the optical fiber 10 has the core 12 at the center of the optical fiber 10, and the cladding 13 including the air holes 11 periodically disposed around the core 12. Incidentally, changing the spacings between adjacent air holes makes it possible to vary the diameter of the core 12, that is, the region surrounded by the air holes 11 arranged with lacking the periodicity.

Please replace paragraph [0083] starting on page 52, with the following:

FIG. 12 shows a cross section of the optical fiber of an example 5 in accordance with the present invention. As shown in FIG. 12, an optical fiber 30 composed of tellurite glass whose zero-material dispersion wavelength is 2.1 μm has a lot of circular air holes 31 which are disposed in a triangular lattice-like fashion, that is, in a periodic manner as in the foregoing example 1. However, at the center of the optical fiber 30, the disposition of the air holes 31 lacks periodicity. In addition, the air holes 31 are filled with a glass material whose refractive index is lower than that of the tellurite glass 33 by Δn. Since the air holes 31 separated from the central of the optical fiber 30 are arranged periodically, they form a cladding 33 for making the total reflection of light. In contrast, the region surrounded by the air holes 31 arranged at the center of the optical fiber 30 with lacking

periodicity forms a core 32 that guides the light. The region~~, that is the core region,~~ has an area from 0.1 to five times of $\pi\lambda^2$, where λ is the wavelength of the light and π is the circular constant.

Please replace paragraph [0085] starting on page 54, with the following:

FIG. 13 shows an optical fiber of an example 6 in accordance with the present invention. As shown in FIG. 13, the optical fiber 40 composed of tellurite glass changes the arrangement of the air holes 31 of the optical fiber 30 described in the foregoing example 5. The disposition of the air holes 41 in the optical fiber 40 is a quadrilateral lattice-like arrangement consisting of a lot of quadrilateral vertices arranged adjacently in a regular (periodical) fashion in a cross section in the direction of the diameter of the optical fiber 40. The arrangement of the air holes 41, however, lacks the periodicity at the center of the optical fiber 40. Since the air holes 41 separated from the central of the optical fiber 40 are arranged periodically, they form a cladding 43 for making the total reflection of light. In contrast, the region surrounded by the air holes 41 arranged at the center of the optical fiber 40 with lacking periodicity forms a core 42 through which the light propagates. The region~~, that is the core region,~~ has an area from 0.1 to five times the area of $\pi\lambda^2$, where λ is the wavelength of the light and π is the circular constant. Incidentally, the air holes 41 are filled with a material whose refractive index is lower than that of the tellurite glass.

Please replace paragraph [0088] starting on page 55, with the following:

FIG. 14 shows an optical fiber of an example 7 in accordance with the present invention. As shown in FIG. 14, the optical fiber 50 composed of tellurite glass changes the arrangement of the air holes 41 of the optical fiber 40 described in the foregoing example 6. The air holes 51 in the optical fiber 50 are disposed at vertices of a hexagonal (honeycomb), which are arranged adjacently in a

regular (periodical) fashion in a cross section in the direction of the diameter of the optical fiber 50. The arrangement of the air holes 51, however, lacks the periodicity at the center of the optical fiber 50. Since the air holes 51 separated from the central of the optical fiber 50 are arranged periodically, they form a cladding 53 for making the total reflection of light. In contrast, the region surrounded by the air holes 51 arranged at the center of the optical fiber 50 with lacking periodicity forms a core 52 through which the light propagates. The region~~, that is the core region,~~ has an area from 0.1 to five times of $\pi\lambda^2$, where λ is the wavelength of the light and π is the circular constant. Incidentally, the air holes 51 are filled with a material whose refractive index is lower than that of the tellurite glass.

Please replace paragraph [0091] starting at the top of page 57, with the following:

FIG. 15 shows an optical fiber of an example 8 in accordance with the present invention. As shown in FIG. 15, the optical fiber 60 composed of tellurite glass changes the arrangement of the air holes 31 of the optical fiber 30 described in the foregoing example 5. In the optical fiber 60, a lot of air holes 61 have a hexagonal shape in a cross section perpendicular to the longitudinal direction of the optical fiber 60. The arrangement of the air holes ~~71~~ <u>61</u>, however, lacks the periodicity at the center of the optical fiber 60. Since the air holes 61 separated from the central of the optical fiber 60 are arranged periodically, they form a cladding 63 for making the total reflection of light. In contrast, the region surrounded by the air holes 61 arranged at the center of the optical fiber 60 with lacking periodicity forms a core 62 through which the light propagates. The region~~, that is the core region,~~ has an area from 0.1 to five times of $\pi\lambda^2$, where λ is the wavelength of the light and π is the circular constant. Incidentally, the air holes 61 are filled with a material whose refractive index is lower than that of the tellurite glass.

Please replace paragraph [0121] starting on page 70, with the following:

FIG. 27A is a cross-sectional view showing the fabricated photonic crystal fiber. The outside diameter of the photonic crystal fiber 207 is 110 μm, and the inside diameter of the air holes is 26 μm. FIG. 27B is an enlarged view of the portion corresponding to the core for transmitting light, and the core diameter is 2.6 μm. The cross sectional area A_{eff}, at which the optical output becomes $1/e^2$ of the peak, is 3.54 μm^2, and the γ value (representing the nonlinearity and equal to $\cancel{2\pi n^2/\lambda A_{eff}}$ $\underline{2\pi n_2/\lambda A_{eff}}$) is 675 $W^{-1}km^{-1}$.

Please replace paragraph [0149] starting on page 81, with the following:

Splicing the photonic crystal fiber of the present example 17 to a silica fiber (with a relative refractive index difference of 4%, and MFD of 3 μm) using a commercially available fusion splicer enables the splicing at a loss of 0.2 dB and a return loss equal to or less than –50 dB. For the purpose of comparison, splicing the photonic crystal fiber with the single composition of the foregoing example 13 and the silica fiber has a loss of 2 dB and a return loss of –19 dB because of the collapse of the core geometry.

Please replace paragraph [0172] starting on page 91, with the following:

FIG. 46 shows a cross sectional view of an optical fiber of the example 20 in accordance with the present invention. Tellurite glass 2101 which is inserted into a jacket tube 2104 and has a zero-material dispersion wavelength of 2.08 μm has four air holes 2103a - 2103d (designated by a generic number 2103 from now on). The air holes 2103 are filled with air and their refractive index is approximately one. The portion surrounded by the four air holes 2103 is a region 2102 to become a core for transmitting light. The outside diameter of the tellurite glass 2101 is ~~2100~~ 100 μm, the

inside diameter of the air holes 2103 is 40 μm, and the core diameter is 4.5 μm. The cross sectional area A_{eff}, at which the optical output becomes $1/e^2$ of the peak, is 4.1 μm^2, and the γ value is 590 $^{-1}km^{-1}$.

Please replace paragraph [0200] starting on page 104, with the following:

FIG. 67 is an enlarged view of the region to become the core of the optical fiber of FIG. 66. In the present example 28, the optical fiber was fabricated by ultrasonic drilling. The outside diameter of the tellurite glass 3001 is 100 μm, the inside diameter of the air holes 3003 is 35 μm, and the core diameter a is 5.5 μm. ~~The diameter d of the air hole 3005 is 0.5 μm.~~ The cross sectional area A_{eff}, at which the optical output becomes $1/e^2$ of the peak, is 3.0 μm^2, and the γ value is 780 $W^{-1}km^{-1}$.